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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,143	12/13/2001	Andrew C. Alduino	42390.P11010	6618

7590 02/10/2006
Charles K. Young
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025-1026

EXAMINER

HUGHES, DEANDRA M

ART UNIT	PAPER NUMBER
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3663

DATE MAILED: 02/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/020,143	ALDUINO ET AL.	
	Examiner	Art Unit	
	Deandra M. Hughes	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's Remarks

1. Applicant's Remarks filed 1/17/06 have been entered.

Drawings

2. With regard to the drawing objection, Applicant's remarks filed 1/17/06 are convincing. The objection to the drawings is withdrawn. Further, the drawing papers have been appropriately identified in the prosecution history.

Claim Rejections - 35 USC § 102

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 24-25, 27-29, 31-34, 37-39, and 41-42 are rejected under 35 U.S.C. 102(e) as being anticipated by Kasamatsu (US 6,288,833 filed Feb. 17, 2000).

With regard to claim 24, Kasamatsu discloses:

- a substrate (fig. 5, col. 3, line 32);
- a waveguide embedded within said substrate (#13), wherein an optical signal may propagate through said waveguide (col. 3, line 41);
- at least two or more light sources (#19) disposed on a first side (side with pump lasers #19) of said substrate along a length of said waveguide to emit light into said waveguide in *substantially* transverse (col. 3, line 35, 'width direction'; also waveguides 21 are *substantially* transverse) to a direction of propagation of the optical signal, the light emitted from said at least two or more light sources to pump the optical signal (col. 3, line 33);

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- a reflector (112) disposed on a second side (side emitting 114) of said substrate to reflect at least a portion of light emitted from said at least two or more light sources into said waveguide, the reflected light pump the optical signal.

With regard to claim 28, Kasamatsu discloses:

- a semiconductor substrate (col. 4, line 47 - silicon or quartz);
- a waveguide (#13) embedded within said semiconductor substrate through which an optical signal may propagate (col. 3, line 41);
- in a direction *substantially* transverse to a direction of propagation of the optical signal (col. 3, line 35, 'width direction'; also waveguides 21 are *substantially* transverse), the light emitted from said at least two or more semiconductor light sources to pump the optical signal (col. 3, line 33).

With regard to claims 25 and 29, the waveguide contains a rare-earth group ion (col. 3, line 33). Erbium (Er) is a well-known dopant for optical amplification. Further, Kasamatsu discloses Er as a rare-earth group ion (col. 4, line 66).

With regard to claims 27, 31, 37, and 41, 980nm and 1480nm are well-known wavelengths for pumping Er-doped fiber amplifiers in the 1.55 micron optical signal range. Further, these wavelengths are disclosed (e.g., col. 1, line 60).

With regard to claims 32, 38, and 42, the reflector and the substrate would inherently have a different refractive index. In particular, the mounting substance of the mirror would inherently have a different refractive index than that of the substrate.

With regard to claims 33-34 and 39, Kasamatsu discloses:

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- a semiconductor substrate (col. 4, line 47 - silicon or quartz);
- a waveguide (#13) embedded within said semiconductor substrate through which an optical signal may propagate (col. 3, line 41);
- said waveguide being doped with erbium (col. 4, line 66);
- at least two or more semiconductor light sources (#19: each source is an array; col. 8, lines 10-16) disposed on a first side of said substrate (side with pump lasers #19) along a length of said waveguide *in a direction substantially transverse to a direction of propagation of the optical signal* (col. 3, line 35, 'width direction'; also waveguides 21 are substantially transverse), to emit light into said waveguide, the light emitted from said at least two or more semiconductor light sources to pump the optical signal, wherein at least two of said at least two or more semiconductor light sources are disposed within a single light source substrate (the semiconductor laser bar is on a single substrate).

Claim Rejections - 35 USC § 103

5. Claims 26, 30, 36, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasamatsu (US 6,288,833 filed Feb. 17, 2000) in view of Lange (US filed Feb. 16, 2001). Kasamatsu does not specifically disclose that the pump light sources are vertical cavity emitting lasers (VCSELs). However, Lange teaches transverse pumping (87) of a waveguide embedded in a substrate by a VCSEL (74; col. 5, line 52). It would have been obvious to one of ordinary skill in the art (e.g., an optical

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engineer) to use a VCSEL to pump the waveguide embedded in a substrate for the advantage of lower cost components, as is taught by Lange (col. 5, line 56).

6. Claims 35 and 43-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasamatsu (US 6,288,833 filed Feb. 17, 2000) in view of Lawrence (US 6,289,027 filed Sep. 11, 2001).

Kasamatsu does not specifically disclose pumping a waveguide in a direction that is perpendicular to the propagation of the optical signal. However, Lawrence teaches orthogonal pumping (#60). It would have been obvious to one of ordinary skill in the art (e.g., an optical engineer) to orthogonally pump the waveguide for the advantage of minimizing signal reflection at the interface.

Response to Arguments

7. Applicant's arguments filed 1/17/06 have been fully considered but they are not persuasive.

Applicant argues the following:

- (A) "...Kasamatsu does not teach or suggest two or more light sources **along a length of said waveguide**." "Instead, as is shown in FIG. 3A and 5-7 of Kasamatsu, either a single multi-mode waveguide semiconductor laser as is used as is shown in Fig. 3A or else multi-mode lasers 19, which are at the end of waveguide instead being spaced along a length of the waveguide, may be used in Figs. 5-7." (pg. 9, 1st paragraph).
- (B) "...Kasamatsu does not teach or suggest **light sources to emit light** into the waveguide in a direction that is **substantially transverse** to a direction of propagation of the optical signal. The light that is emitted by the laser is the so-called excitation ray 115 shown in Fig. 4 of Kasamatsu. As is clearly shown, the excitation ray 115 is not in a direction that is substantially transverse to a direction of propagation of the optical signal." (pg. 9, lines 11-16).

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- (C) "Lange does not remedy what is missing from Kasamatsu." (pg. 10, lines 18-19).
- (D) "Kasamatsu and Lawrence should not be combined. Kasamatsu discusses a waveguide that receives light from the edge and provides light from the edge. Lawrence discusses a waveguide that receives light from the top and couples the light downward into an optical fiber." (pg. 11, 3rd paragraph)
- (E) "...even if Kasamatsu and Lawrence were combined, which doesn't even seem appropriate, the combination still does not teach or suggest the limitations of the **independent** claims." (pg. 11, 4th paragraph; emphasis added).

Argument (A) is not persuasive because in the broadest reasonable interpretation to one of ordinary skill in the art, the Examiner identified the length direction as the direction that is referenced in col. 3, line 35 as the 'width direction'. This is clearly identified in the three previous office actions dated 7/26/05, 1/14/05, and 9/16/05. It is common for one of ordinary skill in the art to interchange the labels width (W), height (H), and length (L) based on perspective. A device that is identified with dimensions of (W x H x L) can easily be identified as (L x W x H) and nonetheless be the same structure.

Argument (B) is not persuasive because figure 5, which is referenced in the office actions dated 7/26/05, 1/14/05, and 9/16/05 discloses emission of light into the waveguide in a direction that is substantially transverse. Applicant clearly understood that figure 5 was being relied upon as disclosure of a direction that is substantially transverse (see Remarks dated 4/19/05, last and 1st paragraphs respectively on pages 6-7). However, Applicant's current arguments are directed to figure 4, which is clearly disclosed by Kasamatsu as a different embodiment. Note Kasamatsu column 4, Brief Description of Drawings, wherein Figure 4 is described as illustrating absorption of the

emitting ray by the device of the **second** embodiment and figure 5 is disclosed as illustrating the **third** embodiment. Consequently, Applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections.

Arguments (C) and (D) are not persuasive because of the reasons stated in the response to Argument (B) above.

Argument (E) is not persuasive because the Examiner does not rely upon Lawrence to reject the **independent** claims.

Conclusion

8. This is a RCE of applicant's earlier Application No. 10/020,143. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Further, the arguments have been addressed (see Action dated 01/14/05 and Advisory dated 5/10/05). Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the


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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deandra M. Hughes whose telephone number is 571-272-6982. The examiner can normally be reached on M-F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Deandra M Hughes
Examiner
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